Report Documents

07/11/16

Reporter-Hui Che
Theme: The theory of gene toggle switch (the first part)
Content:

1. Solve the interacting problem of genes' expression via mathematical model.
2. Choose situations in mathematical model which are suitable for cells.
3. Use necessary mathematical software to simulate curve, find different steady states by changing parameters.
4. Finally we conclude that the necessary demands for double-steady state, first, restrain efficiency parameter, beta, and gamma should be large enough, larger than 1; second, keep balance of the two kinds of repressor' synthetic speed.
5. The connection between this article and our project: the conversion between high and low state combines with the 0-1 signal in digital circuit, which can realize the conversion from gene sequence to gene circuit.

07/12/16

Reporter-Zhongtian Ma
Theme: Gene circuit model (the first part)
Content:

1. Describe toggle model from building chemical master equation.
2. Simulate the conversion possibility via probability and tendency function.
3. As for how to obtain the combination between reality and mathematical model from formulas, I didn't get point.

07/13/16

Reporter-Caixi Xi
Theme: Gene circuit model (the second and third part)
Content:

1. Apparent toggle switch by Pap.
2. Simplify switches without influence of DAM enzyme, only considering the system constructed by Pap operator, LRP protein and PapI. In the system, there are four possible states for different combinations between LRP and Pap operator.
3. There are 8 reactions in the system, which need 8 tendency function for description.

07/14/16

Reporter-Hao Xu
Theme: The theory of gene toggle switch (the second and third part)
Content:

1. In discrete time situation, study dynamic development of system:
$$u' = u(t + delta\ t) = u(t) + (du/dt)(t) * delta\ t$$
2. Its essence is obtaining first derivative in Taylor expansion, error is in direct proportion to step length. If we use four-order Runge-Kutta algorithm, error will decrease to in direction proportion to the fifth power of step length.
$$k1 = h\ f(t, y(t))$$
$$k2 = h\ f(t + h/2, y(t) + (1/2)*k1\ )$$
$$k3 = h\ f(t + h/2, y(t) + (1/2)*k2\ )$$
$$k4 = h\ f(t + h, y(t) + k3\ )$$
3. Type code to realize change of u and v, besides the image of du/dt and dv/dt, analyze relationship between them.

NOTEBOOK

07/15/16

Reporter-Yuening Yan
Theme: Work of insulators and RiboJ
Content:

1. Conception-transfer function: the ratio of activity of input and output promoter of logic gate.
2. Envisage: If transfer function is a property of logic gate, that is, if we fix activity of input promoter, for a logic gate, its output promoter activity will be the same.
3. Experiment: For different input promoter, the transfer function values are different.

07/16/16

Reporter-Wei Zhao
Theme: Output measurement of gene circuit
Content:

1. Work theory of flow cytometer and how to do separation of levels of cells.
2. The quantitative method for measuring reporter gene activity.
3. Assess results from comparative degree.

07/17/16

Reporter-Haobo Zhou
Theme: The theory of gene toggle switch
Content:

1. Change gene toggle switch using inducer.
2. Influence of inducer's concentration to building steady state.
3. Influence of initial state to final state.

07/19/16

Reporter-Chenxiang Zheng
Theme: Summary of core algorithm
Content:

1. The theory of gene toggle switch + Runge-Kutta algorithm → concentration degree
2. Chemical master equation + FSP algorithm → molecule degree
3. Pay attention to probability of states' appearance at every moment.

07/20/16

Reporter-Jun Li
Theme: Speed and enthusiasm——LZ4 compress
Content:

1. LZ4 can support multithreaded environment and obtain higher compressing and decompressing speed.
2. The process of development: Technology of multimedia → lossless compression → dictionary-based format → LZ77 algorithm → LZ4 algorithm.
3. The core of LZ77 is searching the longest matching string from buffer.

07/21/16

Reporter-Meng Liu
Content:

1. Show the initial visual interface of software.
2. Introduce the software for coding the front-end application.

NOTEBOOK

07/22/16

Reporter-Jianwei Xu
Theme: DNA information storage
Content:

1. Use Haffman chart to transfer bases.
2. Introduce the realization step for storage.
3. Store information via parity and provide algorithm to optimize redundancy.

07/23/16

Reporter-Dongkai Pu
Theme: DNA information storage algorithm
Content:

1. The process of information storage.
2. Length and function of each portion of DNA sequence.
3. Efficiency problem of information storage and speed problem for decoding and storage.

07/25/16

Reporter-Mingfei Ding
Theme: Optimize the program code
Content:

1. For a climax issue, comparing human thought with code logic, we choose the human thought to realize what we want.
2. In specific operation, we use logic that is not consistent with human thought.
3. For optimizing code, there is no rules and regulation, but only targeted and specific operation.

07/26/16

Reporter-Xin Ma
Theme: What is Python
Content:

1. Introduce the program language, python.
2. Compare python with other language by specific example.
3. Know the situation of use of Python nowadays.

07/27/16

Reporter-Zining Wu
Theme: Django
Content:

1. The history of Web development framework.
2. Django can express requirement and response as simple Python object.
3. Reflect relationship of objects.

07/28/16

Reporter-Group leader
Theme: Period work.
Content:

1. Scientist group, DNA storage group, visualization group and Documentation group cleared up the period work and plan the next task.
2. The instruction provided some suggestions.

NOTEBOOK

07/29/16

Reporter-Hui Che
Theme: SBOL Definition Modules
Content:
1. What is SBOL.
2. Grammar rule of RDF/XML language in SBOL.
3. Resolve mathematical model in SBOL and the relationship between modules.
4. Write the standardizing content in SBOL.

08/02/16

Reporter-Zhongtian Ma
Theme: Part-junction interference
Content:
1. Part's function will be influenced by heredity, environment and adjacent part.
2. Test whether the adjacent sequence of pLlacO-1 will generate interference.
3. Test the interference of coding sequence function.

Reporter-Caixi Xi
Theme: Insulator's function
Content:
1. Each insulator's sequence, origin and performance.
2. Test whether the adjacent sequence of pLlacO-1 will generate interference.
3. Test the interference of coding sequence function.

08/03/16

Reporter-Hao Xu
Theme: The third part of supplemental materials, modularity of combined circuit and curve prediction.
Content:
1. Calculator method, the improved FSP algorithm.
2. Definite three simple gene regulation and control model.
3. Predict simple gene regulation and control model.

08/04/16

Reporter-Yuening Yan
Theme: Analyze of iGEM software project over the years.
Content:
1. Aims of some iGEM software project which is relevant with ours.
2. Specific contents of some projects.
3. The thought of other projects and what we need to do.

NOTEBOOK